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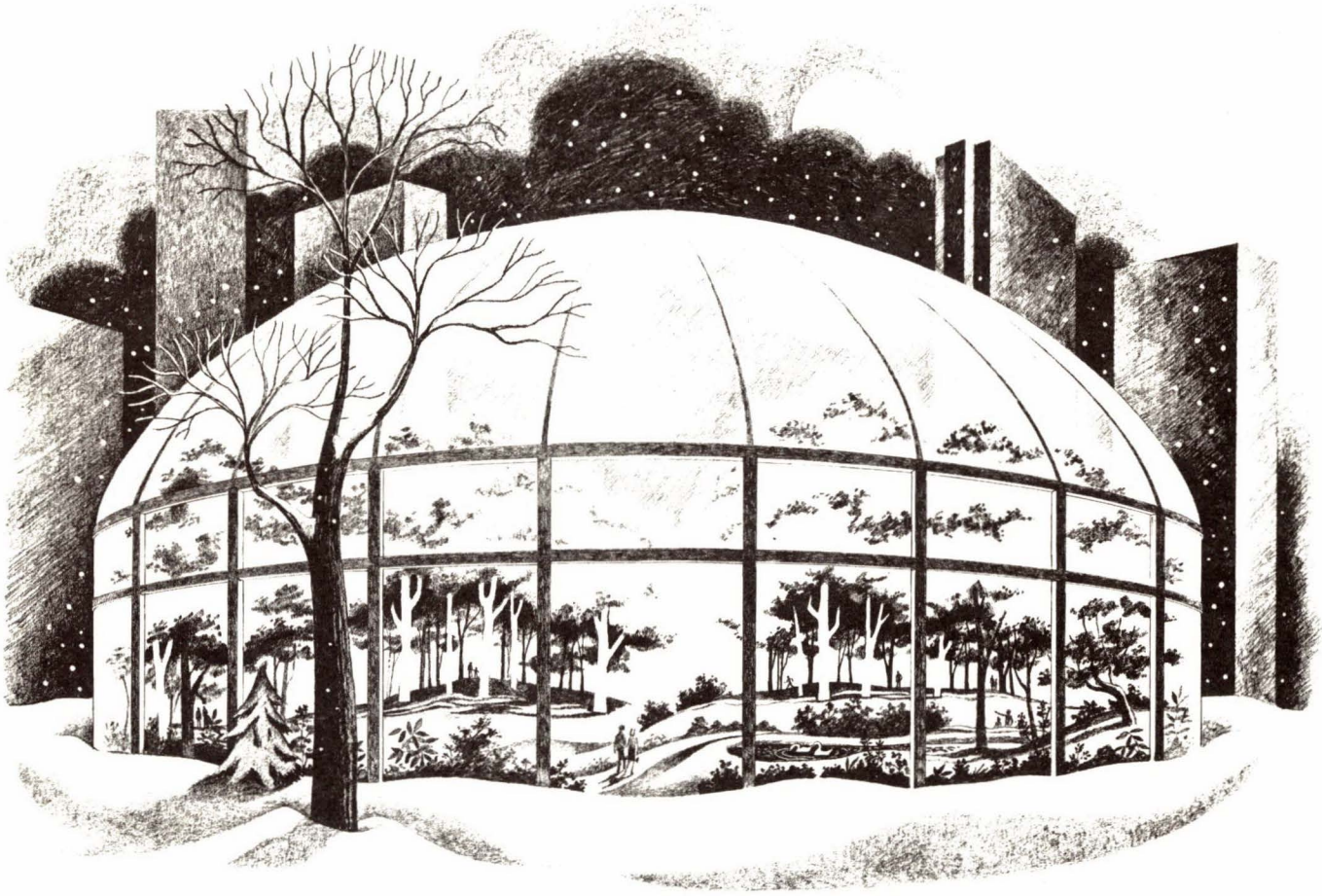
FUTURE RECREATION ENVIRONMENTS



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To aid policymaking and decisionmaking about future environmental problems, a panel of experts was asked to predict the probabilities of future events associated with natural resource management; wildland recreation management; environmental pollution; population, work force, recreation; and urban environments. This booklet contains detailed descriptions of these futures.

This booklet was originally published in 1974 as Future Leisure Environments, Research Paper NE-301, by the Northeastern Forest Experiment Station, Forest Service, Upper Darby, Pa.

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FUTURE RECREATION ENVIRONMENTS

To grow, indeed to survive, a democratically based technology-oriented society must anticipate and avoid changes that will detrimentally affect its basic life-support systems: soil, water, air, flora, and fauna. Otherwise that society is on a course toward extinction. Furthermore, the faster that changes occur within man-environment systems, the more critical it becomes to search the future so as to adjust present policies and programs for coping adequately with future environmental problems.

By searching out the prospects of what tomorrow's environments are likely to be, we can provide direction and scope to new policies that will insure a desirable future, a future in which man can live in harmony with nature. But the future must be specified, and obstacles along the way must be delineated so that a desirable course—no matter how diverse and challenging—can be charted.

That is the purpose of this paper: to probe the unexplored territory that lies ahead in our path to the future, and to forecast those points in time when relevant technological, social, ecological, and institutional changes are likely to occur. Based on a survey of experts' opinion, median dates and interquartile ranges are forecast for 125 future events cataloged into one of the following five categories: natural resource management; wildland recreation management; environmental pollution; population, work force, recreation; and urban environments. Information is intended to stimulate the thinking of decisionmakers in these five broad categories and to provide direction for formulating policies to deal with future environmental problems.

Although we are seeking to forecast important future environmental conditions, this study is not a crystal-ball undertaking. Other writers have suggested what man's condition will be in 1984 (*Orwell 1949, Huxley 1958*); in the next 20 years (*Michael 1965*); at the end of the 20th century (*Wall Street Journal 1966*); or even a 100 years to 1,000 years from now (*Stapleton 1931*).

Our projections can be doubted, and we hope readers will vigorously debate them. The more people who begin to think seriously about where we are headed, the better. We invite you readers to comment about the events we discuss here, and to offer your own ideas.

STUDY DESCRIPTION

The Delphi Technique

The research strategy used in this study is known as the Delphi technique (*Helmer and Rescher 1960*). In ancient Greece, when one sought knowledge of the future, the Oracle of Delphi was consulted; today, the experts are consulted to determine what events are likely to occur in a given field. The technique derives its importance from the realization that projections of future events, on which public policy decisions must rely, are based largely on the personal insight of informed individuals rather than on predictions derived from well-established current theory.

Helmer and Rescher (*1964*) have described the philosophical basis of the Delphi technique as the process of combining expert opinions into a group consensus. The Delphi technique has proved extremely useful for long-range forecasting of technological developments, evaluating sociological-institutional events, examining the consequences of political alliances, devising war-prevention techniques, and determining economic growth indexes. Results of these kinds of studies provide a basis for policy formulation and long-range planning (*Bright 1968*).

Instead of using the traditional approach toward achieving a consensus through open debate, the Delphi technique "eliminates committee activity altogether, thus . . . reducing the influence of certain psychological factors, such

as specious persuasion, unwillingness to abandon publicly expressed opinions, and the bandwagon effect of majority opinion" (*Helmer and Rescher 1960*).

The Delphi technique replaces direct debate with a series of questionnaires sent to a selected panel of experts. Successive questionnaires contain opinion feedback from previous panel responses. Inquiries about reasons given by various panel members are used to stimulate other panel members to consider points they may have overlooked and to reevaluate factors they had at first thought to be unimportant.

Panel of Experts

An important aspect of the Delphi procedure involves the selection of the panel of experts. Results of a Delphi survey are only as good as the expertise of the panel participants. Panel members were selected on the basis of their current literary or legislative contributions in one or more of several broad subject-matter areas. In this study, 405 of 904 experts (44.8 percent) initially enlisted remained to the end of the study.

Experts in natural resource management made up more than half of the final panel membership; experts in environmental pollution made up 11 percent, and ecologists 10.4 percent. The expertise of the rest of the panel was divided equally among recreation resource management, commercial recreation equipment development, and population dynamics specialists. About 4 of 10 panel members were employed by public land management agencies, 2 in 10 by educational institutions, and 1.5 in 10 by communications industries. The remainder were divided among public regulatory agencies, legislative bodies, quasi-public environmental organizations, and industry.

The Delphi study proceeded through four rounds.

Round One

In round one, each expert was asked to list the most significant events he felt would have a 50-50 chance of occurring by the year 2000. Experts were instructed to consider only events that related to their own area of expertise. Panel members were instructed to assume an essentially stable political situation and sustained economic growth to the year 2000. The possibility of all-out nuclear war was excluded. Beyond these assumptions, panel members were asked to make their own assumptions about the future.

Round Two

For round two, events suggested in round one were summarized, edited, and grouped into three subject-matter areas: institutional and social events, natural resource management and policy events, and events related to environmental technology. Three questionnaires, one for each of these subject-matter areas, were mailed to all panel members. Each respondent was asked to answer the questionnaire that contained events most closely related to his area of expertise (some experts were knowledgeable in all three areas), and to state the year in which he felt each event had a 50-50 chance of occurring. Panelists were also given the opportunity to indicate if they felt an event would never occur.

In summarizing round-two events, we found that many median estimates of the date an event would probably occur went beyond the year 2000. Nevertheless, all events were retained for consideration in subsequent rounds.

Round Three

In round three we sent respondents a graphic summary of the range of dates for round two events and another questionnaire. The summary contained an event-by-event description of the interquartile range and median point for the distribution of dates predicted for events listed in round two. The interquartile range contains the middle 50 percent of all dates forecast for any one event. The median is the center of this range; that is, the middle item in an array of dates.

In the graphic results sent to each respondent, we placed an asterisk at that point in time where he indicated (in round two) that each event would occur. Thus, each respondent could judge where his response fell relative to responses of all other panel members who responded to the same event. In responding to each round-three event, each panel member was asked to consider:

1. His round-two responses in light of the response distributions of all other panel members.
2. To change his round-two estimates if he cared to.
3. If his round-three estimates fell outside the graphed interquartile range for any given event, he was asked to justify his response.

Round Four

Round four was similar to round three—the same summary information was provided—but in addition, major arguments presented in round three were summarized by event. Panel members were asked to consider these arguments in arriving at their final decisions as to when each event was likely to occur.

Results were summarized at the end of round four. Through successive rounds, the distributions of responses around the median-year prediction were continually reduced. In some cases, the median changed. Throughout all four rounds, if a panel member failed to respond to a questionnaire, he was dropped from the panel.

RESULTS

Events contained in the Delphi questionnaire are grouped into five categories: natural resource management, wildland recreation management, environmental pollution, population-work force-recreation, and urban environments. Figures 1 through 5 summarize events in each category.

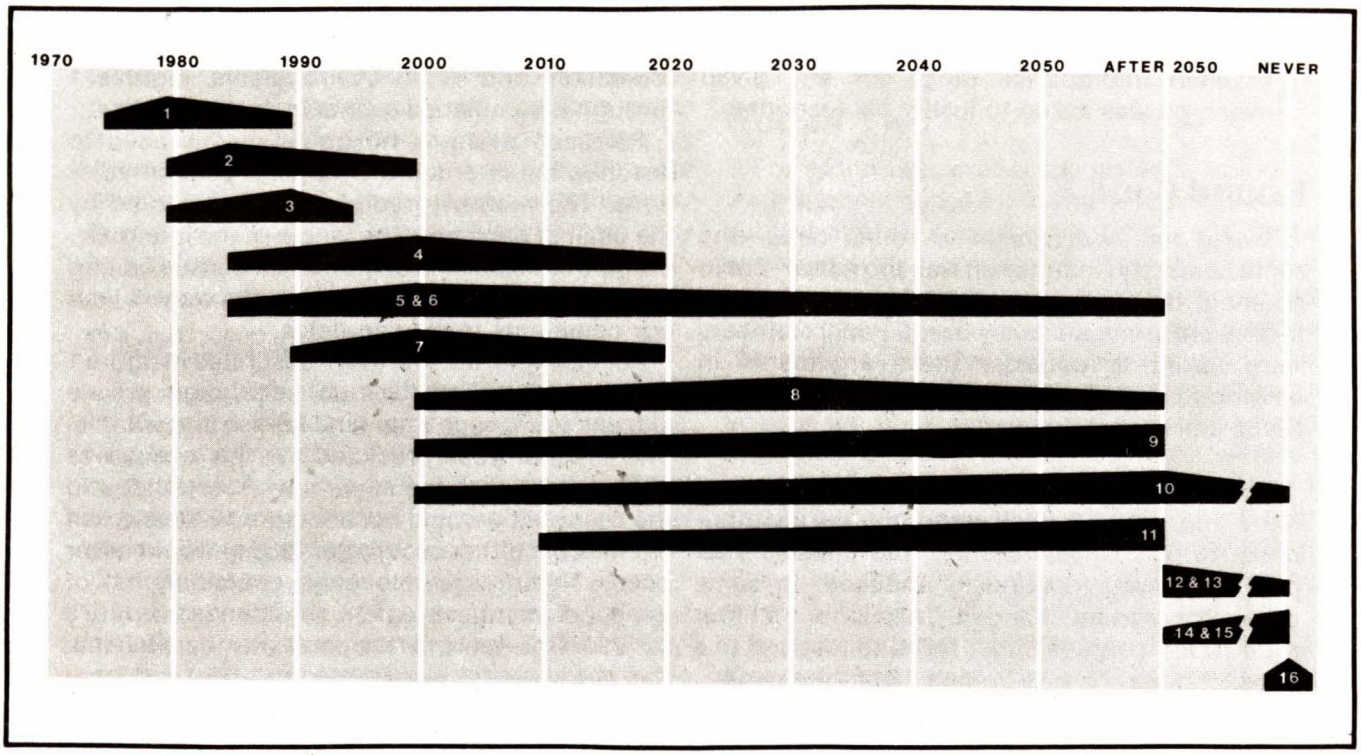
For each event, a horizontal bar is used to describe the interquartile range of panel predictions. The median prediction is represented by the peak of each bar. The length of the interquartile bars indicates the degree of consensus among experts. In our discussion of results we will limit our comments to median dates.

For example, the first event described in figure 1 is: economic incentives to encourage private citizens to manage their land for fish and wildlife. The median year predicted for this event was 1980; that is, half the experts who responded to the event felt it would occur before 1980, and half felt it would either occur after 1980 or would never occur. The interquartile range, containing half of the panel member predictions, extends from 1975 to 1990. One-fourth of the panel members felt that the event would occur before 1975, and one-fourth felt that it would either occur after 1990, or would never occur.

Figure 1

CONSENSUS OF PANEL ON NATURAL RESOURCE MANAGEMENT

(Medians and interquartiles)



NATURAL RESOURCE MANAGEMENT

1980

1. Economic incentives to encourage management of private land for fish and wildlife.

1985

2. Tax credit to private landowners who provide scenic amenities.

1990

3. Federal land, water, and air use plan established.

2000

4. National land use zoning policy established.
5. Preempted public recreation land replaced with comparable land.
6. Coordinated environmental planning between government and private enterprise.
7. Most marine and estuarine areas managed for fish and wildlife habitat.

2030

8. Electrical power rationed by national priorities.

After 2050

9. National per-capita land requirement established.
10. Some natural and manmade lakes heated for swimming.
11. Viable international agreement on allocation of the world natural resources.
12. Shoreline along navigable rivers placed in public ownership.
13. All intensively developed recreation facilities under public management.

Never Occur

14. All water and land recreation resources under federal control.
15. Cease construction of new highways.
16. All recreation facilities provided by commercial enterprise.

Natural Resource Management

(Figure 1)

In the discussion that follows, the numbers in parentheses refer to events in the figures. Most panel members predicted a rapidly expanding governmental role in natural resource management. The 1980 economic incentives offered private landowners who manage for fish and wildlife (1) will broaden by 1985 to include tax incentives for providing scenic amenities (2).

The Federal role in coordinating natural resource planning will expand from establishing the first land, water, and air use plan in 1990 (3) to a national land use zoning policy in 2000 (4). By 2000 environmental planning will be effectively coordinated among all levels of government and private enterprise (6). Also by 2000, land use patterns will stabilize, land preempted for one use being replaced with comparable land (5). All natural resources, including marine and estuarine areas (7), will be under intensive management. Growing demand for electrical power will require rationing according to a national priority system by 2030 (8).

Although panel members disagreed about the exact year, most foresaw continuing expansion in national and international planning and control of natural resources after 2050 (11). A national per-capita land requirement will be established after 2050 (9). Growing demands, particularly for recreation resources, will require that natural resources be used more intensively. Heating of manmade lakes to allow year-round recreation (10) and public control of shoreline along all navigable water (12) will occur after 2050. Because of a dwindling resource base, public agencies will operate most resource-based recreation facilities (13).

Although most panel members agreed that government will play an increasingly important role in natural resource management and planning, they felt that control over use of privately owned resources will always remain with private owners (14, 16). They also felt that construction of new highways will never cease (15).

Wildland Recreation Management

(Figure 2)

Expert opinions reflect an increasingly important role of recreation in influencing wildland management and policy. By 1980, restrictions will start on recreational use of wildland areas. Glass containers will be prohibited from wildland recreation areas (5), and use of all off-road recreational vehicles will be restricted to designated areas (3). To expand the use of scarce resources, recreation activities in an area will be assigned time periods (1). Computers will be used to advise recreationists where to go for recreation (4), and information and education efforts will be expanded to improve the quality of recreation experiences (2).

Restrictions on recreation use will also be expanded to maintain the quality of recreation experiences. By 1985, restrictions will be placed on the number of people allowed to use a wilderness or remote area at one time (10). Maximum noise levels will be established to maintain the quality of recreation experiences and environments (6). The recreation experience itself will change, with facilities such as cable TV hookups available at most campgrounds (9); and acceptable restrictive management techniques will be employed to control recreation use patterns (7). Also by 1985, economic incentives will be available to private landowners who open their land for public recreation (8).

Increasing recreation pressure will require additional restrictions on recreational use of wildland resources by 1990. Restrictive management techniques will be used to reinforce heavily used recreation areas and to direct use patterns (14). Public recreation areas will be assigned maximum carrying capacities, and use will be kept at or below capacity levels (12). Recreation use of developed public recreation facilities will be by reservation only (16). Maximum recreational boat motor sizes will be set for public water bodies to alleviate use pressures and to prevent environmental degradation (15). Fishermen will pay for the use of saltwater fish resources (11).

Figure 2

CONSENSUS OF PANEL ON WILDLAND RECREATION MANAGEMENT

(Medians and interquartiles)

WILDLAND RECREATION MANAGEMENT

1980

1. Different recreation activities allocated specific time periods for the same recreation management area.
2. Information about the flora, fauna, and historical features provided at most public recreation areas.
3. Use of off-road vehicles restricted in public recreation areas.
4. Computers used to advise recreationists where to go for recreation.
5. Cans and glass containers prohibited from wildland recreation areas.

1985

6. Maximum noise levels enforced in recreation areas.
7. Recreationists accept restrictive management procedures such as closing or altering recreational use to maintain and preserve vegetation, water quality, and wildlife.
8. Economic incentives available to private landowners who open parts or all of their land for public recreation.
9. Cable TV available at most campgrounds.
10. Use of wilderness areas restricted to maintain or enhance the quality of a wilderness experience.

1990

11. Saltwater fishermen required to purchase federal fishing licenses.
12. Public recreation lands assigned a carrying capacity—the maximum level of use an area can sustain without loss of natural values—and use will be kept at or below that level.
13. Year-round skiing on artificial surfaces.
14. Management techniques, such as wear-resistant footpaths, electronic guide systems, and fences to direct recreation users, accepted for managing outdoor recreation areas to allow increased use without adversely affecting the resource.
15. Recreational boat-engine size restricted on all public water bodies.
16. Camping in public areas by reservation through a national information-retrieval system.

2000

17. Wilderness area management includes seeding, planting, fire control, and other intensive management techniques to maintain the wilderness environment.
18. Remote sensing devices used to monitor park use.
19. Captive rearing commonly used to rear endangered species for release into the wild.
20. Animal migrations monitored by satellite.
21. Nonpolluting propulsion methods, such as electric power, replace internal-combustion engines in recreational vehicles.
22. Travel in large parks by systems that minimize transportation effects on natural resources; for example, air transport, underground rapid transit, tramways, and cable cars.
23. Certification of wilderness users required.
24. Airstrips and helicopter pads established at most popular recreation areas.
25. Utility lines within sight of recreation areas placed underground.
26. Waste-disposing bacteria incorporated into recreation equipment.
27. Permits used to control all resource-based recreation.
28. Photography and observation are primary uses of wildlife resources.
29. Small private recreational submarines used as commonly as snowmobiles are used today.
30. Motorized vehicles excluded from hunting areas during hunting season.
31. Most resource-based recreation areas lighted for night use.
32. Extensive areas in arid regions irrigated to enhance recreational opportunities.

2020

33. Man-made islands created solely for recreation.

2025

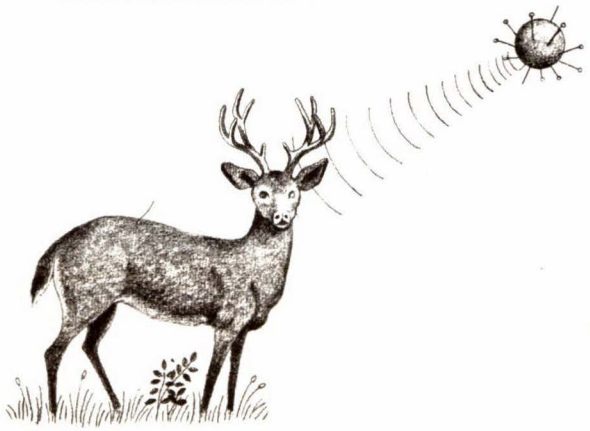
34. Half the states permanently revoke licenses of fish- and game-law violators.

2050

35. The last acre of wilderness is designated.

After 2050

36. Wilderness management philosophy allows more intensive recreational developments.
37. Only foot travel allowed in major public parks.
38. The first tract of land will be withdrawn from wilderness status.
39. Self-contained underwater resorts.
40. Hover-craft used as commonly for recreation as the snowmobile is used today.
41. Jet-powered backpacks sold at prices accessible to middle-income families.
42. Hunting legal only on specified game lands.
43. Robots used for park maintenance and public-information programs.
44. One-man, low-speed helicopters commonly used for transportation within wilderness areas.
45. Wildlife populations managed by birth-control techniques.
46. Hunting firearms utilize laser beams.
47. Rivers constructed strictly for recreation.
48. First park established on the moon.
49. Fees at public recreation areas set to cover all capital and maintenance costs.
50. National parks and recreation lands open for daytime use only.
51. Public allowed to use all rural land for hunting and fishing.



Growing recreation demands on wildland resources will require that increasing controls be placed on use of recreational resources. By 2000, wilderness area management philosophy will, by necessity, change to more intensive management to maintain the wilderness environment (17). Permits, used to control all resource-based recreation (27), will also include certification for certain user groups, such as wilderness users (23).

Wildland recreation areas of 2000 will be vastly different from those of today. Only travel systems that have a minimum physical and visual impact on park environments will be allowed (22). Only recreation vehicles that employ nonpolluting propulsion systems will be allowed in recreation areas (21). Popular wildland recreation areas will be serviced by air (24). Park environments will be aesthetically improved by underground placement of all utility lines (25).

Technology will assist the park manager in 2000, as well as create new management problems for him. Artificial lighting will extend use of resources well into the night (31), and remote-sensing devices will be used to monitor park use (18). Waste-disposing bacteria, incorporated into recreational equipment, will reduce sanitary disposal problems (26). Extensive irrigation of arid regions will broaden and enhance recreational opportunities (32). Technology will also create recreational opportunities (32). Technology will also create recreation equipment that will provide challenging management problems. For example, experts felt that by 2000, small private submarines will be in common use (29).

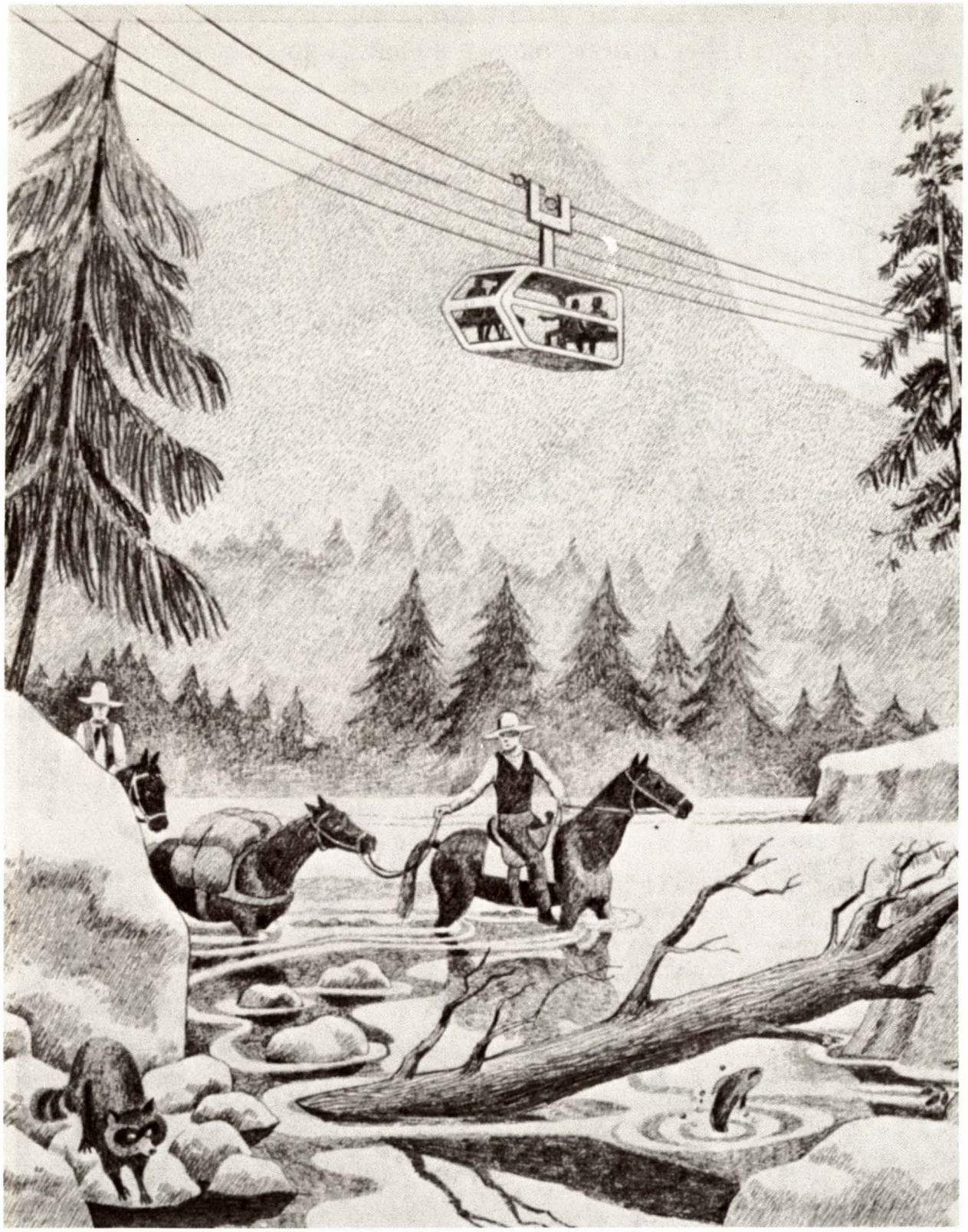
Rather than rely on natural reproduction, the wildlife manager in 2000 will utilize captive rearing to raise endangered species for release into the wild (19). Migrations will be monitored by satellite to assist in developing management programs (20). Controls will be placed on hunting; motorized vehicles will be excluded from hunting areas during hunting season (30). But by 2000, the primary use of wildlife resources will change from hunting to nonconsumptive uses like photography and observation (28).

Although the picture drawn by the experts for beyond the year 2000 becomes quite hazy, trends in events to that time appear to continue into the 21st century. Dwindling open space for wildland recreation will require that by 2020 islands be constructed for recreation space (33). The last acre of wilderness, as currently defined, will be designated in 2050 (35). Wildlife resources will be much more intensively managed, at least half the states permanently revoking licenses of fish- and game-law violators (34).

Although experts were not specifically asked to forecast events far into the 21st century, they named many events that they felt would occur sometime after 2050. Most experts felt that, beyond 2050, wilderness area management philosophy will by necessity change to include management for intensive recreation activities, and wilderness aspects will be reduced in importance (36). In fact, land will start to be withdrawn from wilderness designation (38). Foot travel will be the only form of transportation allowed within major parks (37).

Technology will have a strong impact on wildland recreation management after 2050. New recreation equipment—hovercraft (40), jet-powered backpacks (41), and one-man helicopters (44)—will be in common use for recreation purposes. Self-contained underwater resorts (39) and rivers constructed for recreation (47) will add significantly to the available supply of recreation resources. A few panel members felt that sometime after 2050 the first park will be in operation on the moon (48). Back on earth, robots will assist the park manager in park maintenance and public-information programs (43).

Some panelists felt that user fees at public recreation areas will eventually be set to cover all costs of providing recreation (49), that public areas will be open only for daytime use (50), and that the public will be allowed to use rural lands for recreation, regardless of ownership (51). However, most experts felt that these events would never occur.



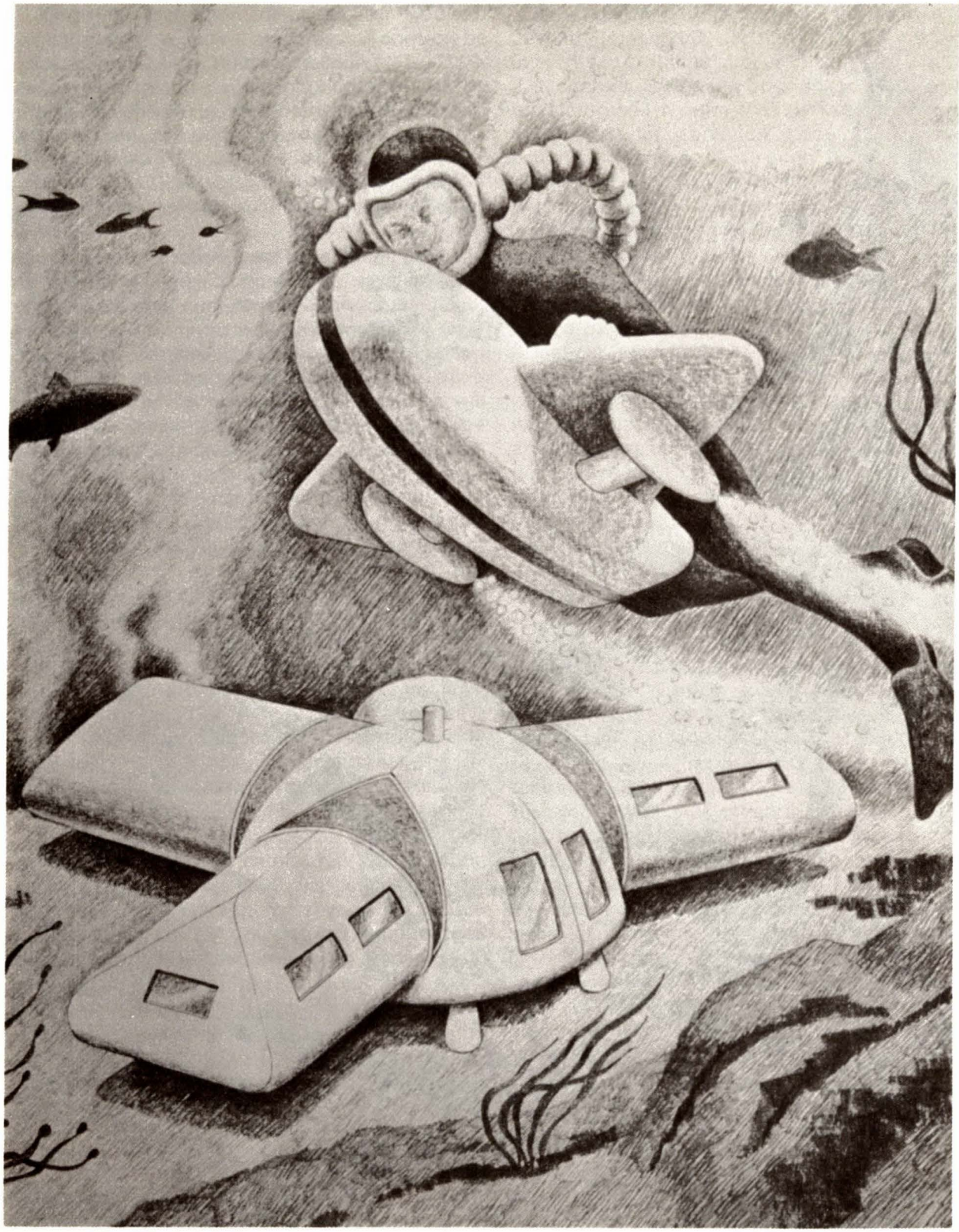
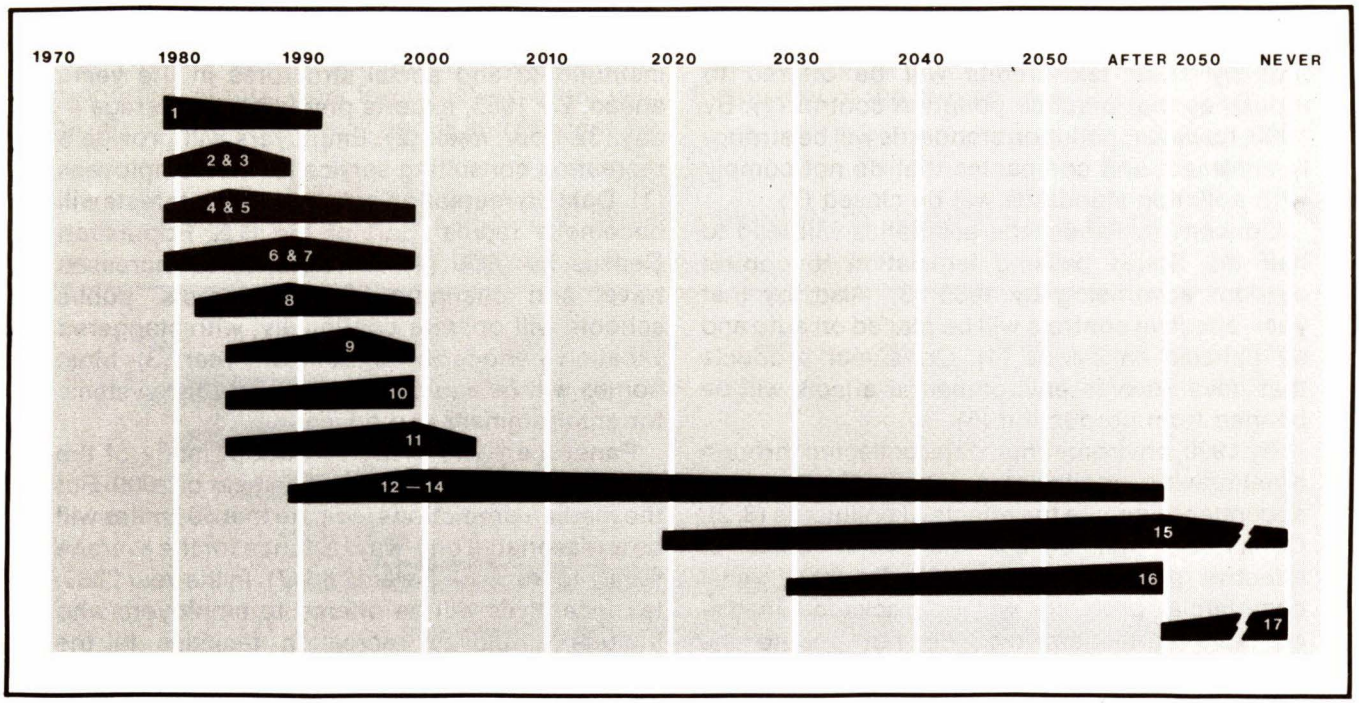


Figure 3

CONSENSUS OF PANEL ON ENVIRONMENTAL POLLUTION

(Medians and interquartiles)



ENVIRONMENTAL POLLUTION

1980

1. Tax credits to industries that practice pollution control.

1985

2. Accurate simulation models for effects of air and water pollution.
3. Half of the states establish standards for outdoor advertising.
4. Effective controls on auto and airplane exhaust emissions.
5. Federal testing for environmental impacts of all consumer products.

1990

6. Consumers accept major costs of pollution control.
7. Companies that do not comply with pollution standards will be closed.
8. An operational nationwide environmental monitoring system.

1995

9. Commercial products packaged in nonpolluting containers.

2000

10. International agency established to halt further air water pollution.
11. International agency established to contain accidental pollution on the open sea.
12. Toxic effects of pollutants determined and tolerance limits set.
13. Federal Reserve chartered banks cease to finance companies that pollute the environment.
14. Only biodegradable chemicals allowed to be discharged directly into the environment.

After 2050

15. Most major lakes and rivers purified to support the kind of aquatic life they had in 1880.
16. Most waste products recycled and utilized.

Never Occur

17. Political boundaries realigned to coincide with natural ecological boundaries.

Environmental Pollution

(Figure 3)

Experts showed remarkable agreement on the years in which they felt major events related to environmental pollution would occur. Most felt that by 1980 tax credits will be offered to industries that practice pollution control (1). By 1990, however, pollution standards will be strongly enforced, and companies that do not comply with pollution standards will be closed (7).

Concern for landscape aesthetics will lead to half the States passing legislation to control outdoor advertising by 1985 (3). Also, by that year, effective controls will be placed on auto and air exhaust emissions (4). Consumer products that have adverse environmental effects will be banned from production (5).

By 1990, environmental data, collected through a nationwide monitoring system, will be used to accurately simulate the effects of pollutants (8, 2). Consumers will accept the major costs of effective pollution control (6). By 1995, most commercial products will be packaged in discardable containers that do not pollute the environment (9).

By 2000, strict pollution controls will be established on both the domestic and international scenes. An international agency will be established to halt further air and water pollution (10, 11). Although predictions varied considerably among panel members, other events predicted for the turn of the century include: setting exact tolerance limits for various pollutants (12), allowing only biodegradable chemicals to be discharged directly into the environment (14), and disallowing Federal Reserve chartered banks to finance companies that are known to pollute the environment (13).

Although panel members felt that most waste products will be recycled (16) and that lakes and rivers will be purified to their 1800 level (15), panel consensus was that these events would not occur until after 2050. Only one out of three experts felt that political boundaries will ever be realigned to coincide with natural ecological boundaries (17).

Population, Work Force, Recreation

(Figure 4)

A growing population with changing attitudes toward recreation will have a major impact on institutional and social structures in the years ahead. By 1985, experts predicted an average 4-day, 32-hour week (2). Employers will provide a recreation consulting service for their employees (1). Data on recreation activities and interests will become a regular part of the U.S. Population Census by 1990 (4). In response to increased travel and changing leisure interests, public schools will operate continually, with staggered vacation periods throughout the year (3). Most homes will be equipped with video-tape systems for entertainment and education (5).

Panel members disagreed about many of the events with a median prediction year of 2000. But the median predictions indicate that 500 miles will be a reasonable one-way distance for the average family to travel on a weekend (7). In the year 2000, tax incentives will be offered to employers who include employee recreation facilities in the design and construction of new plant facilities (6).

Both the structure of recreation and the social attitude toward it will change substantially by the year 2000. "Weekends" will be distributed throughout the week (9), thereby effectively increasing the supply of recreation facilities. With an average retirement age of 50 years (8), people will enjoy more total leisure during retirement. In response to abundant leisure, the role of public schools will expand to provide for recreational needs of the entire community (11). Middle-income families will vacation as commonly on other continents as they vacation in the United States today (13). Panel members also felt that by the year 2000 the work ethic will assume a smaller role in governing society, and recreation will become an acceptable life sytle rather than a reward for work (10).

An attempt will be made to control population growth through tax incentives in 2000 (12). But panel experts felt that eventually a mandatory

population-control program will be necessary (15).

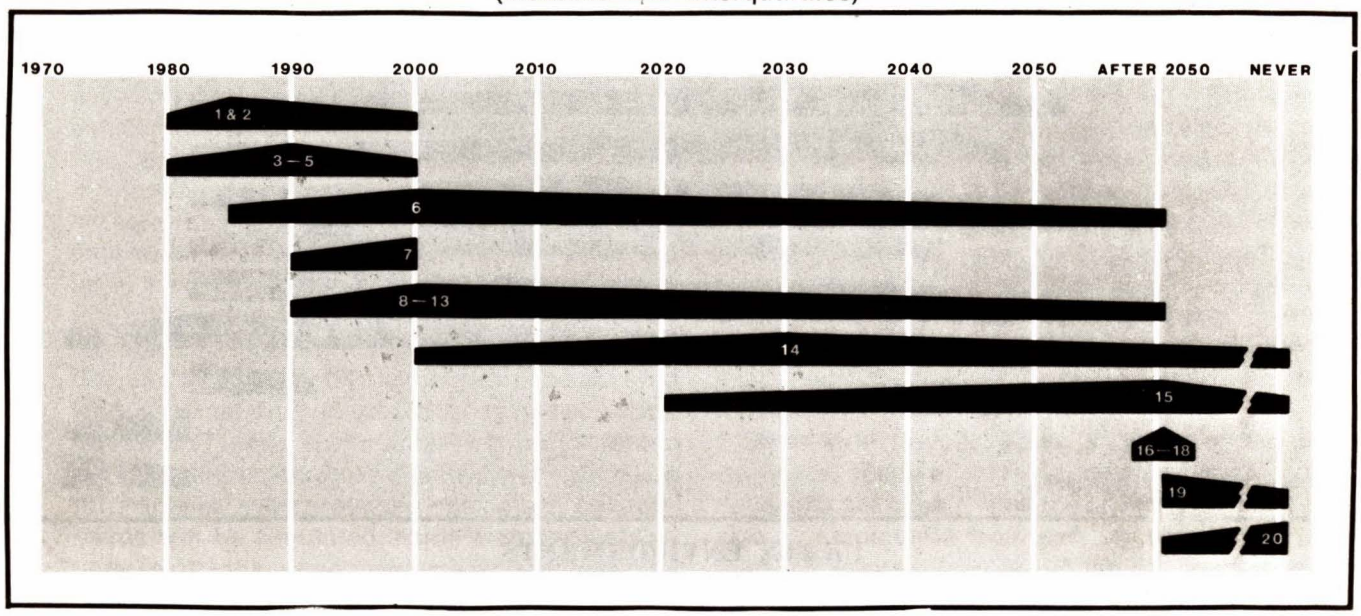
Panel members agreed that some time after 2050, people will have an average annual vacation of 3 months (16). They will enter the work force at an average age of 25 (19) and live to 100 years (17). Experts were about equally divided on the proportion of total work force that will eventually be required to produce all goods and services for the entire population. Half the panel felt that 20 percent of the total work force could accomplish this sometime after 2050, while others felt that this would never occur (18).

Although some panel members thought it possible, most felt that compulsory genetic measures would never be established to improve the quality of the human race (20).

Figure 4

CONSENSUS OF PANEL ON POPULATION, WORK FORCE, RECREATION

(Medians and interquartiles)



POPULATION, WORK FORCE, RECREATION

1985

1. Companies will consult employees on what sort of recreation activities would be best for their physical and mental health.
2. Most people work a 4-day, 32-hour week.

1990

3. Public schools open year-round with staggered vacations.
4. U. S. Census of population includes questions on the recreation activities and needs.
5. Most homes have video-tape systems.

2000

6. Employers given tax incentives to include recreation facilities in plants.
7. Fve hundred miles is a reasonable one-way distance to travel for a weekend.
8. Average retirement age is 50 years.
9. "Weekends" distributed throughout the week.
10. Leisure is an accepted life style.
11. Public schools function to serve the recreation needs of the entire community.
12. Attempt to control population through tax incentives.
13. Middle-class Americans vacation on other continents as commonly as they vacation in the United States today.

2030

14. Most middle-income families own their own vacation home.

After 2050

15. Nationwide mandatory population control.
16. The average worker has a 3-month annual vacation.
17. The average lifespan is 100 years.
18. Twenty percent of the available work force used to produce goods and services for the entire population.
19. Average entry into the work force at 25 years of age.

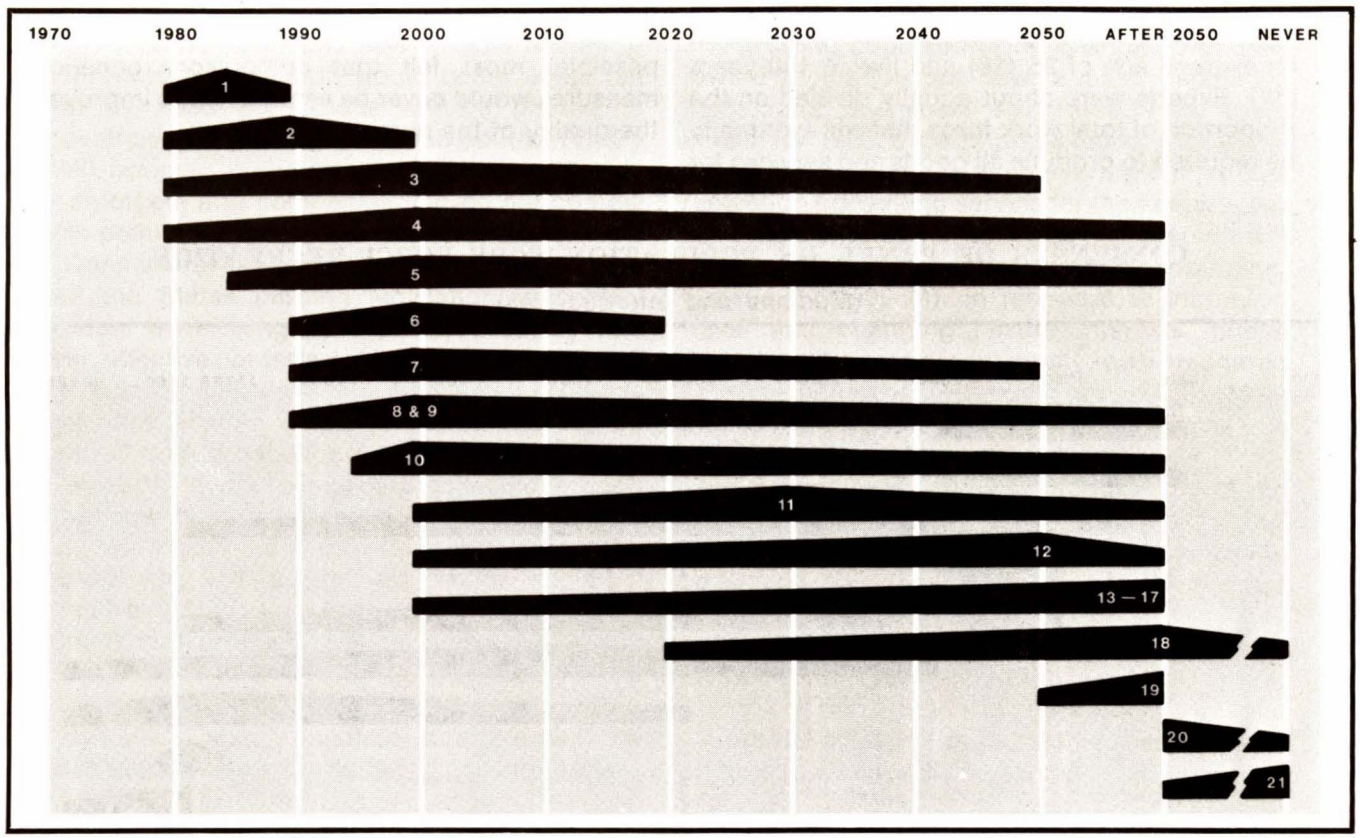
Never Occur

20. Compulsory genetic measures initiated to improve the human race.

Figure 5

CONSENSUS OF PANEL ON URBAN ENVIRONMENTS

(Medians and interquartiles)



URBAN ENVIRONMENTS

1985

1. Special fishing areas established in urban areas for the handicapped, elderly, and children.

1990

2. Small private aircraft excluded from metropolitan airports.

2000

3. Cemetery land and other open land in urban areas used for recreation.
4. Simulated indoor environments available that provide recreational opportunities now available only in the outdoors.
5. All water reservoirs open to public recreation.
6. Only nonpolluting vehicles allowed in urban areas.
7. Artificial turf used in most public field sports areas and on some golf courses.
8. Green space preserved between most metropolitan areas.
9. Some city parks or parts of parks enclosed in all-weather protective bubbles.
10. Computers used to direct and control movements of individual transportation units.

2020

11. Most metropolitan areas provide adequate outdoor-recreation opportunities so that most urban residents do not feel the need to go to the country for recreation.

2050

12. "Camping" available in multistory structures similar to parking garages.

After 2050

13. Roofs of many downtown buildings used as public playgrounds.
14. New urban growth displaced to relatively uninhabited regions.
15. High-speed public-transit systems built between most urban areas and major rural recreation facilities.
16. Most city blocks have a minipark or play lot.
17. Ninety percent of the U.S. population lives in urban areas.
18. Apartment structures designed so that they can be detached and moved to recreational areas.
19. Self-contained floating cities with year-round residents.
20. Self-contained underwater cities.

Never Occur

21. Transparent roofs cover most cities.

Urban Environments

(Figure 5)

Panel members agreed that improved planning and technology will combine to make urban environments much more enjoyable in the future than they are today. By 1985, more emphasis will be placed on providing recreational services for specific urban population groups. For example, experts felt that special fishing areas will be established in most urban areas for the handicapped, elderly, and children (1).

By 1990, panel members predicted that private aircraft will be excluded from metropolitan airports (2). Controls on urban transportation will expand greatly by 2000, when only nonpolluting vehicles will be allowed in downtown urban areas (6). Computers will be used to direct and control movement of individual transportation units (10).

The urban area of 2000 will be attractive and livable. More land will be provided for recreation enjoyment; and cemeteries (3), water reservoirs (5), and added green space will be opened to recreational use (8). Recreation-serving facilities, like city parks and playfields, will be covered with artificial turf to sustain heavy recreation pressure (7), and some areas will be protected with all-weather bubbles to allow year-round use (9). Panelists even predicted that natural environments will be simulated inside manmade structures to provide urban residents with recreational opportunities now available only in the outdoors (4).

Panel members felt that by 2020, most urban areas will contain adequate recreation facilities so that the majority of residents will not feel the need to go outside their city for outdoor recreation (11). Recreation facilities will be developed in and near urban areas so that by 2050 even overnight camping facilities will be found within urban areas (12).

Panel members predicted a continual expansion of recreation-serving facilities beyond 2050: roofs of downtown buildings will be used as public playgrounds (13), miniparks or play lots will be provided on each city block (16), and living structures will be designed so that they can be separated for movement to distant recreation areas (18). High-speed transit systems will eventually be available that connect major urban areas with wildland recreation areas (15). Although they predicted that 90 percent of the United States population will live in cities (17), panel experts felt that sometime after 2050 all new urban growth will be displaced to remote, relatively uninhabited regions (14). The form of urban development will change drastically after 2050, and self-contained floating cities and underwater communities will serve new urban growth (19, 20). Although some panel members felt it would occur, most felt that transparent roofs will never be constructed to cover major cities (21).

SUMMARY

In an era when momentous long-term decisions about man and his environment must be made, similar attention should be given to the underlying prediction-making process upon which all planning must be based. For example, the United States government staked 20 billion dollars on inventing a future that included placing a man on the moon by 1970. Similarly, many other potential *futures* are open to man. In this study we have examined 125 aspects of probable man-resource futures.

Short-term (5-year) forecasting—upon which many of today's man-resource management decisions are based—has the advantage of being able to extrapolate from existing trends. But in many man-resource relationships, long-range forecasts are needed that consider future breakthroughs in technology that may appear and interact before a specific future event occurs. Thus the variables and contingencies of most futures beyond 5 years from now can only be assessed intuitively.

Since the use of intuitive forecasting as a basis for long-range planning is unavoidable, we have attempted to obtain this intuitive judgment as systematically as possible from persons who are recognized experts in the areas of concern—ranging from future urban environments to future wilderness management situations.

You may feel that some of our forecasts are fantastic and unbelievable. Perhaps; but consider the simple fact that man began to fly only in the early 20th century, and today he uses space ships to reach beyond his own solar system for answers about the universe.

Jules Verne once said, "What man can imagine, man can do." We have presented here a glimpse of only a few events that experts imagine will happen in the decades ahead, and even beyond. If the results of past predictions of man's progress are any indication of the likelihood that the events listed here will occur, then we can only suggest that in all probability many of the events will undoubtedly occur sooner than forecasted.

Here comes tomorrow. Will we be ready?

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